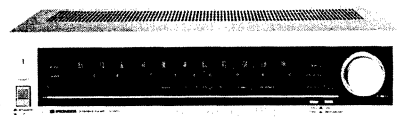
PIONEER®

Service Manual

CIRCUIT DESCRIPTIONS
REPAIR & ADJUSTMENTS



ORDER NO.
ART-653-0

STEREO TUNER

TX-520

MODEL TX-520 COMES IN FIVE VERSIONS DISTINGUISHED AS FOLLOWS;

Type	Voltage	Remarks
KU	AC120V only	U.S.A. model
YP	AC240V only	Australia model
S/G	AC110V, 120V, 220V and 240V (Switchable)	U.S. Military model
S	AC110V,120V, 220V and 240V (Switchable)	General export model
SS	AC110V, 120V, 220V and 240V (Switchable)	Soutch Africa model

- **This service manual is applicable to the KU type.**
- **When repairing the YP,S and S/G types, please see page 25.**
- **Ce manuel d'instruction se refère au mode de réglage, en français.**
- **Este manual de servicio trata del método de ajuste escrito en español.**

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ADDITIONAL SERVICE MANUAL 25
(FOR YP,S AND S/G TYPES)

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1. SPECIFICATIONS

FM Tuner Section

Usable Sensitivity 10.8dBf (1.9μV)
50dB Quieting Sensitivity
  MONO 17.3dBf (4.0μV)
  STEREO 39.2dBf (50μV)
Signal-to-Noise Ratio (at 65dBf)
  MONO 75dB
  STEREO 70dB
Distortion (at 65dBf)
  MONO 1kHz; 0.1%
  STEREO 1kHz; 0.2%
Capture Ratio 1dB
Alternate Channel Selectivity (400kHz) 60dB
Stereo Separation
  1kHz 40dB
Frequency Response . . . . . 30Hz to 15kHz $^{+0.5}_{-1}$ dB
Spurious Response Ratio 75dB
Image Response Ratio 55dB
IF Response Ratio 80dB
AM Suppression Ratio 55dB
Muting Threshold 19.2dBf (5μV)
Antenna Input . . . . . 300 ohms balanced, 75 ohms unbalanced

AM Tuner Section

Sensitivity
  IHF ferrite antenna 300μV/m
  IHF external antenna 30μV
Selectivity 25dB
Signal to Noise Ratio 50dB
Image Response Ratio 40dB
IF Response Ratio 70dB
Antenna . . . . . Ferrite loopstick antenna

Audio Section

Output (Level/Impedance)
  FM (100% MOD) 650mV/3.6kΩ
  AM (30% MOD) 150mV

Miscellaneous

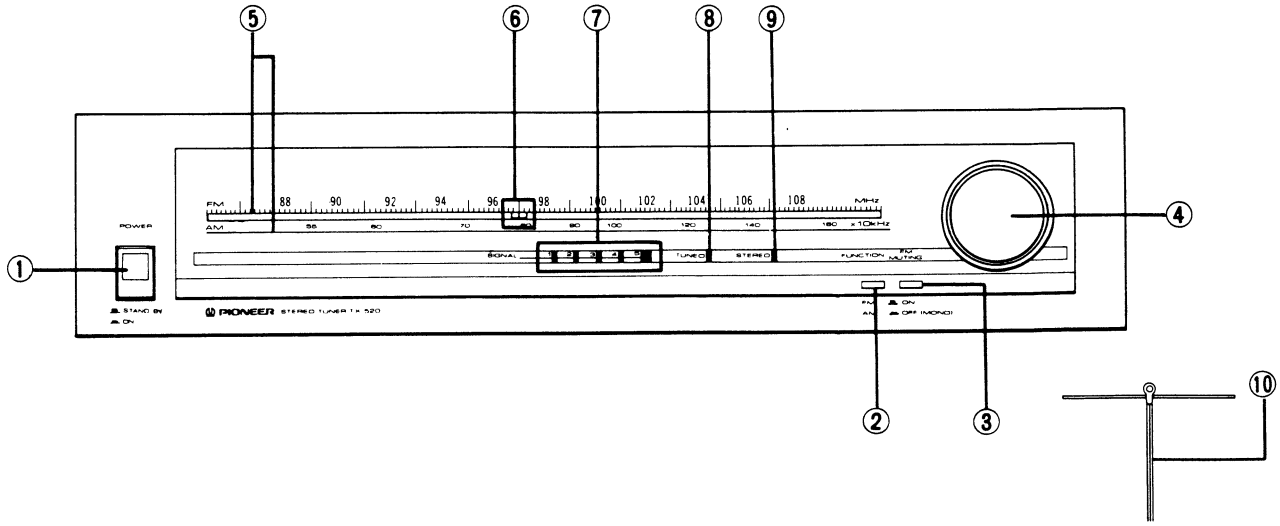
Power Requirements . . . . . AC 120V, 50/60Hz
Power Consumption 11W
Dimensions . . . . . 420(W) x 94(H) x 254(D)mm
16-9/16(W) x 3-11/16(H) x 10(D) in
Weight (Without Package) 3.2kg (6lb 13oz)

Furnished Parts

FM T-type antenna 1
Operating Instructions 1

NOTE:
Specifications and the design subject to possible modification without notice due to improvements.

2. FRONT PANEL FACILITIES



① POWER SWITCH

When this switch is set to the ON position, power is supplied to the tuner's main circuits. The unit's power switch is geared to selecting the transformer's secondary and so even at the STAND-BY position, the unit's circuitry will work as long as the power cord is connected to the power outlet.

Disconnect the power cord from the power outlet when you do not plan to use the unit for a long period of time.

② FUNCTION SWITCH

When listening to an FM broadcast – Set the function switch to the OUT (▲) position.

When listening to an AM broadcast – Set the function switch to the depressed (▼) position.

③ FM MUTING SWITCH

When selecting an FM broadcasting station, this switch removes the irritating noise between stations. It should normally be in the ON position.

When the signal is weak and there is a great deal of noise or distortion with this switch ON, making it difficult to hear, then it should be pressed to put it in the OFF position (in this case mono reproduction is obtained).

This switch does not work for AM broadcasts.

④ TUNING KNOB

Turn this to select a broadcasting station (FM or AM).

⑤ DIAL SCALE

This indicates the frequency of the broadcasting station (FM or AM).

upper number (88 – 108) – frequency of FM station

lower number (55 – 160) – frequency of AM station

⑥ DIAL POINTER

This moves right or left when the tuning knob is turned. Line it up with the frequency of the station you want to listen to.

⑦ SIGNAL INDICATOR

This indicates the strength of the signal from the (AM or FM) broadcasting station to which you are presently listening. The larger the number of the lamps lit up, the stronger the signal (a strong signal indicates that reception conditions are optimum).

⑧ TUNED INDICATOR

This lights up when an FM broadcasting station is being received. This lamp does not light up when an AM broadcast is being received.

⑨ STEREO INDICATOR

This lamp lights up automatically when an FM broadcast is in stereo. It does not light up when the FM MUTING switch is set to OFF.

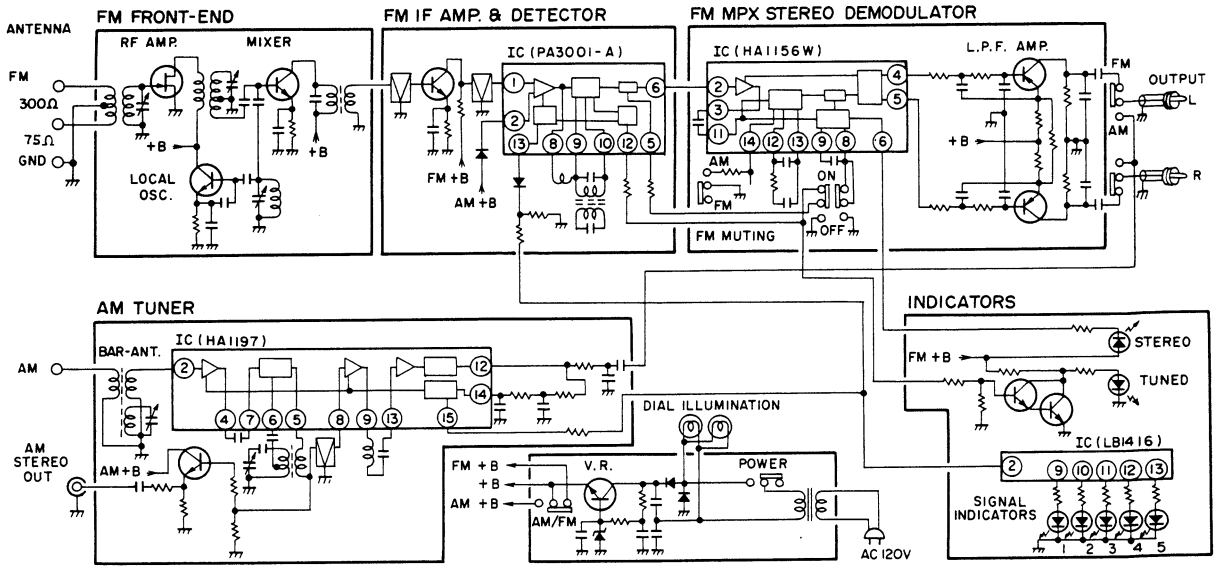
⑩ FM T-TYPE ANTENNA

This antenna permits FM broadcasts to be heard until a regular FM antenna is installed.

NOTE:

When the broadcasting station is far away, or in case of weak signals blocked by mountains, it might not be possible to receive FM broadcasts with this antenna. In such a case, please install an antenna exclusively for FM use outdoors.

3. BLOCK DIAGRAM



4. CIRCUIT DESCRIPTIONS

FM Tuner

The FM front end is comprised of a J-FET (2SK168) single-state RF amplifier, an NPN transistor mixer, and an NPN transistor modified Clapp local oscillator.

The IF stage consists of 2 dual-element ceramic filters, a single transistor amplifier element, and an IF system IC (PA3001-A) which incorporates the IF limiter amplifier, FM detector, and the FM muting circuit.

FM Multiplex Stereo Decoder

The stereo decoder stage employs an FM MPX IC (HA1156W-P), while the subcarrier signals (frequencies above 19kHz) are removed by an —18dB/oct. active filter consisting of a PNP transistor. This active filter also serves as an amplifier for frequencies within its passband, and eliminates crosstalk.

AM Tuner

This employs a 2-ganged tuning capacitor, a dual-element ceramic filter, and an IC (HA1197) consisting of a RF amplifier, mixer, 2-stage IF amplifier, detector and AGC circuit.

Signal Strength Indicator

The TX-520 signal strength meter is a 5-point LED display meter driven by the meter drive IC (LB1416). The signal meter drive signals from the FM and AM tuner sections are applied to a set of 5 voltage comparators which are activated according to the difference between the applied signal level and the respective reference voltage levels allotted to each comparator, resulting in the LEDs(1—5) being lighted.

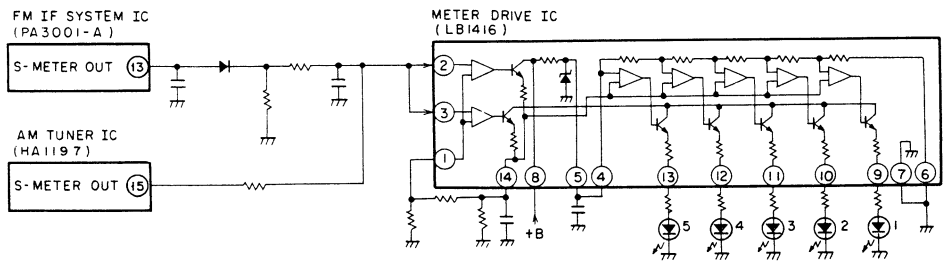


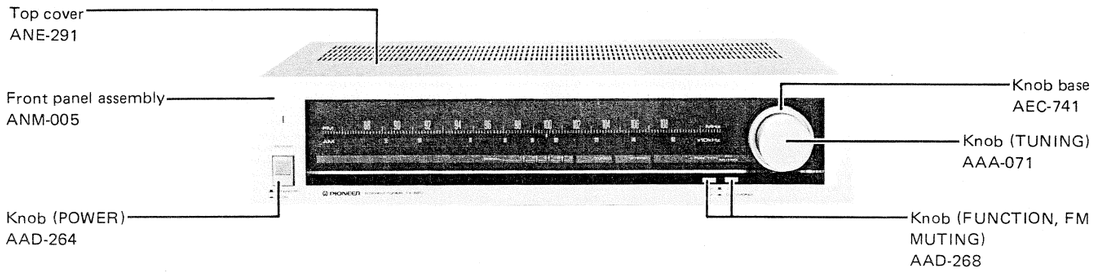
Fig. 4-1 Signal indicator circuit

5. PARTS LOCATION

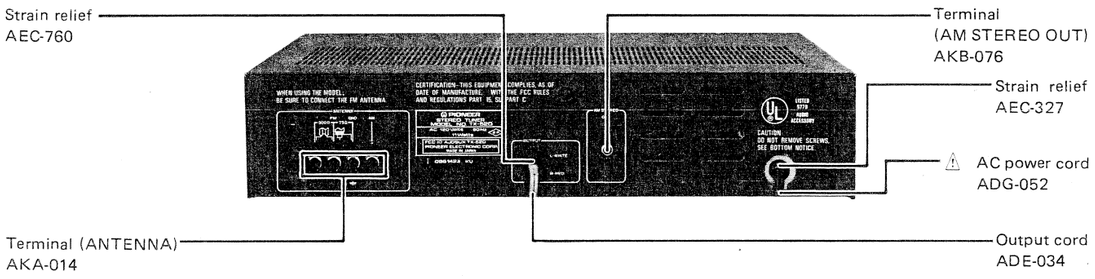
NOTES:

- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★ .*
  ★★ GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

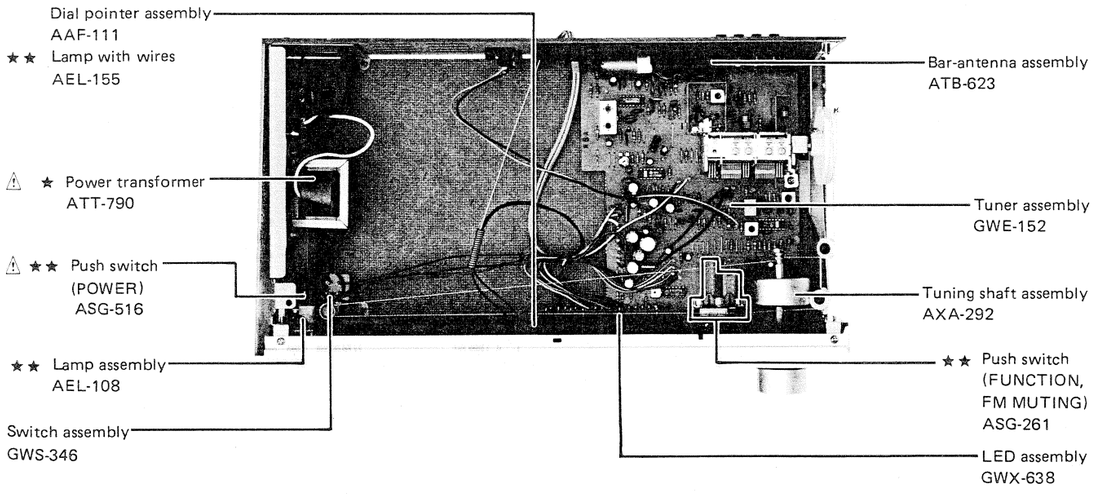
Front Panel View



Rear Panel View

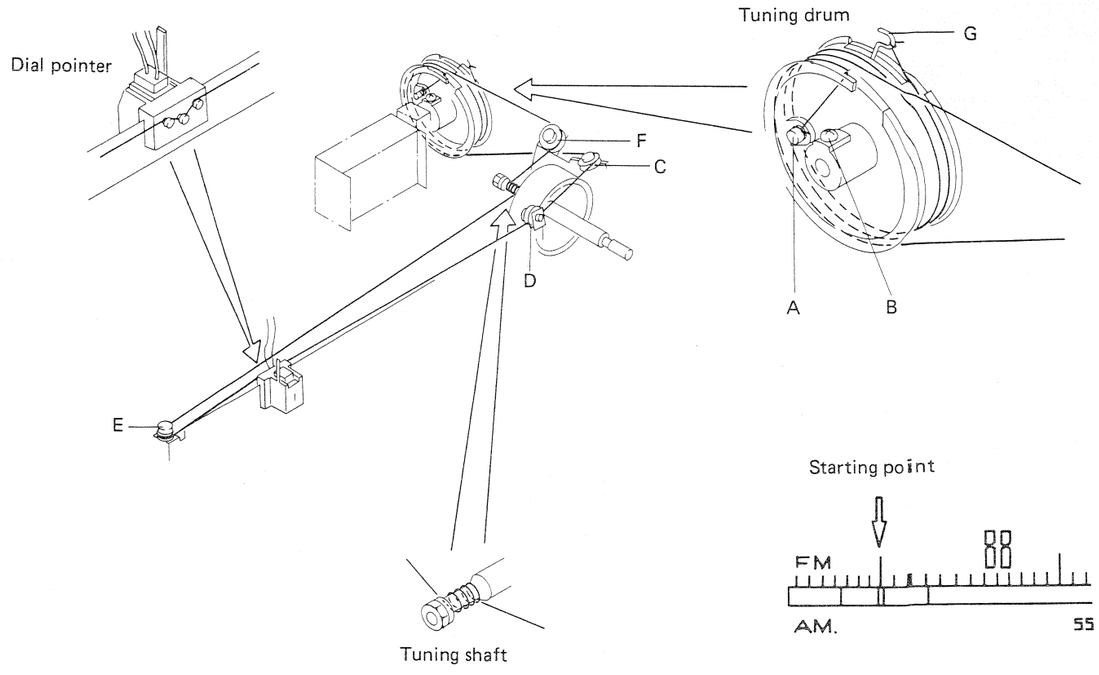


Top View

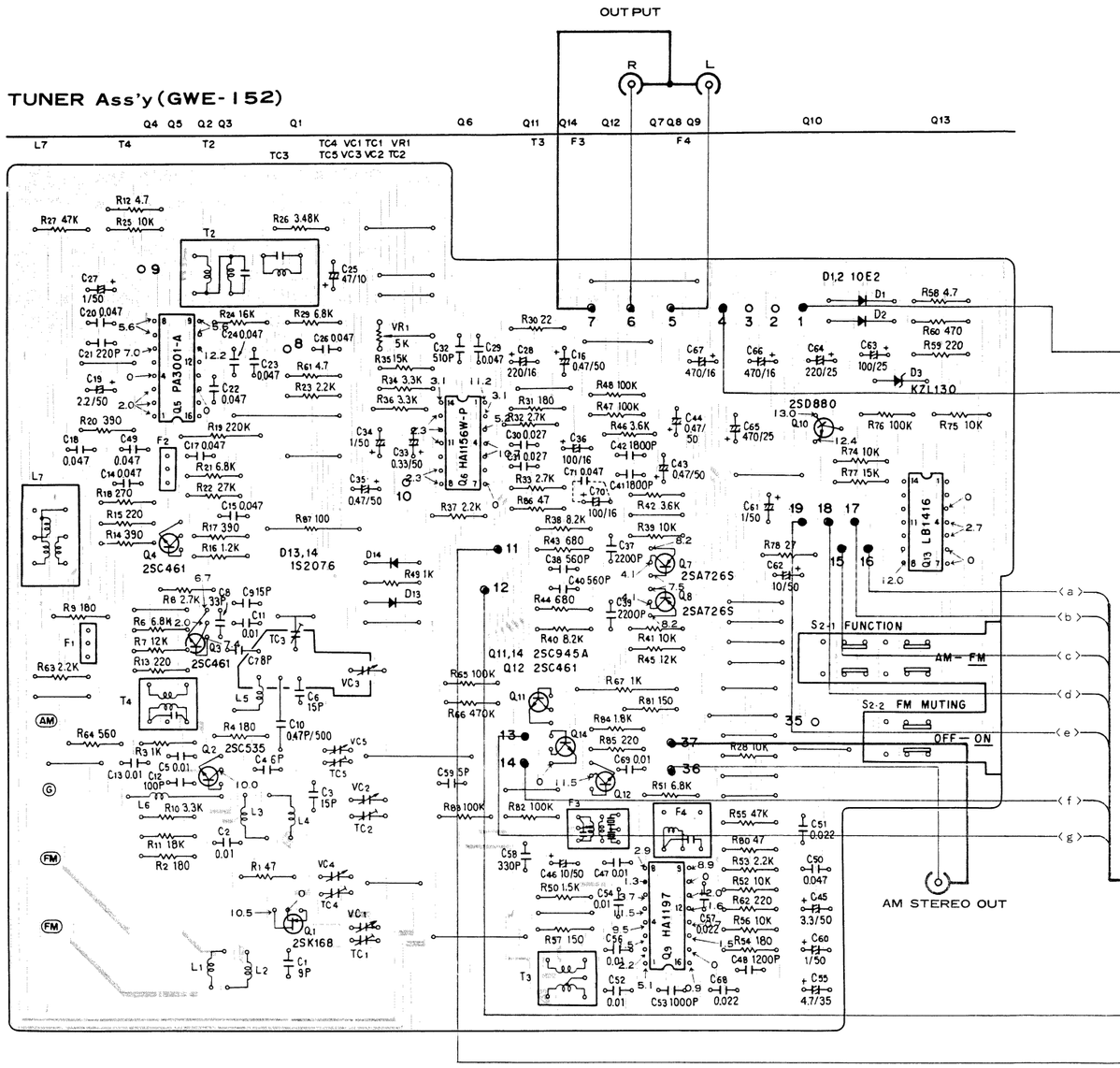


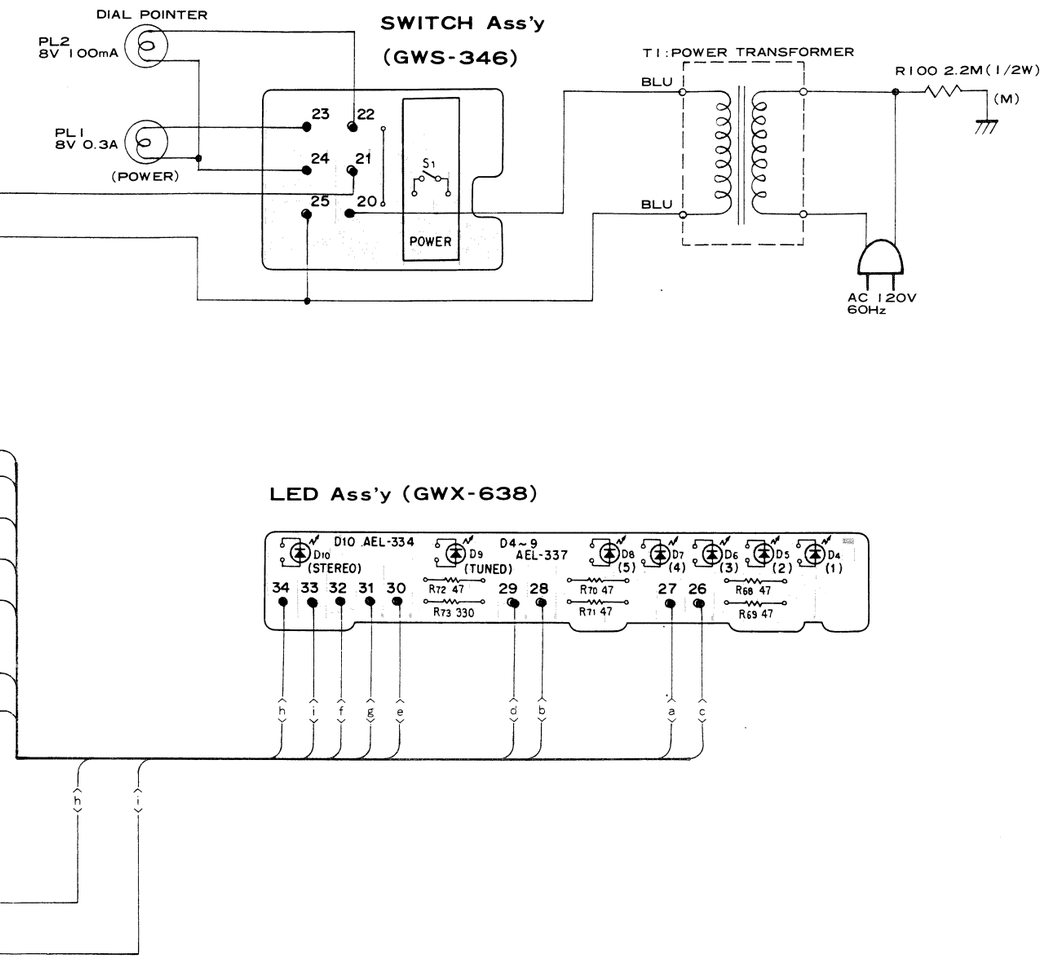
6. DIAL CORD STRINGING

1. Remove the top cover and front panel.
2. Remove the tuning drum from the shaft of the tuning capacitor.
3. Tie one end of the cord to the stud A located inside the tuning drum.
4. Rotate the tuning capacitor right around until the rotor blades are fully intermeshed.
5. Secure the tuning drum back onto the tuning capacitor shaft, making sure that the securing screw B faces directly upward.
6. Pass the cord out through the small opening in the circumference of the tuning drum (see diagram), and then take it over pulleys C, D and E in that sequence.
7. Wind the cord around the tuning shaft 3 times.
8. Pass it over pulley F, wind it around the tuning drum 2 times, and finally tie it to the spring hook G so that it is tensioned.
9. Turn the tuning shaft, and check that the cord moves smoothly.
10. Cut off any excess cord.
11. Turn the tuning shaft counter-clockwise as far as it will go.
12. Align the dial pointer with the starting point of the dial scale, and then pass the cord over it.
13. Check that the dial pointer is in line with the starting point of the dial scale.
14. Finally apply the locking paint to the cord securing positions (stud A and spring hook G) and the dial pointer connection.



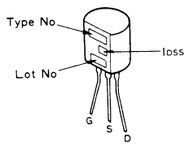
7. P.C.BOARDS CONNECTION DIAGRAM



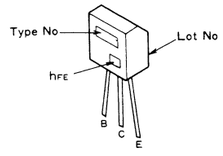


External Appearance of Transistors and ICs

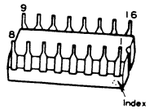
2SK168



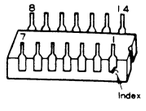
2SC461
2SC535



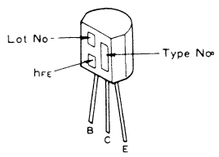
PA3001-A
HA1197



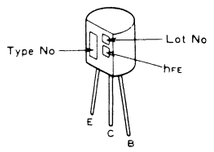
HA1156W-P



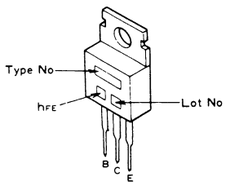
2SA726S
2SC2575



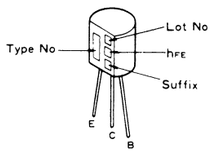
2SA750



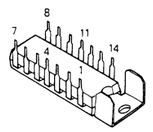
2SD880
2SD313



2SC945A

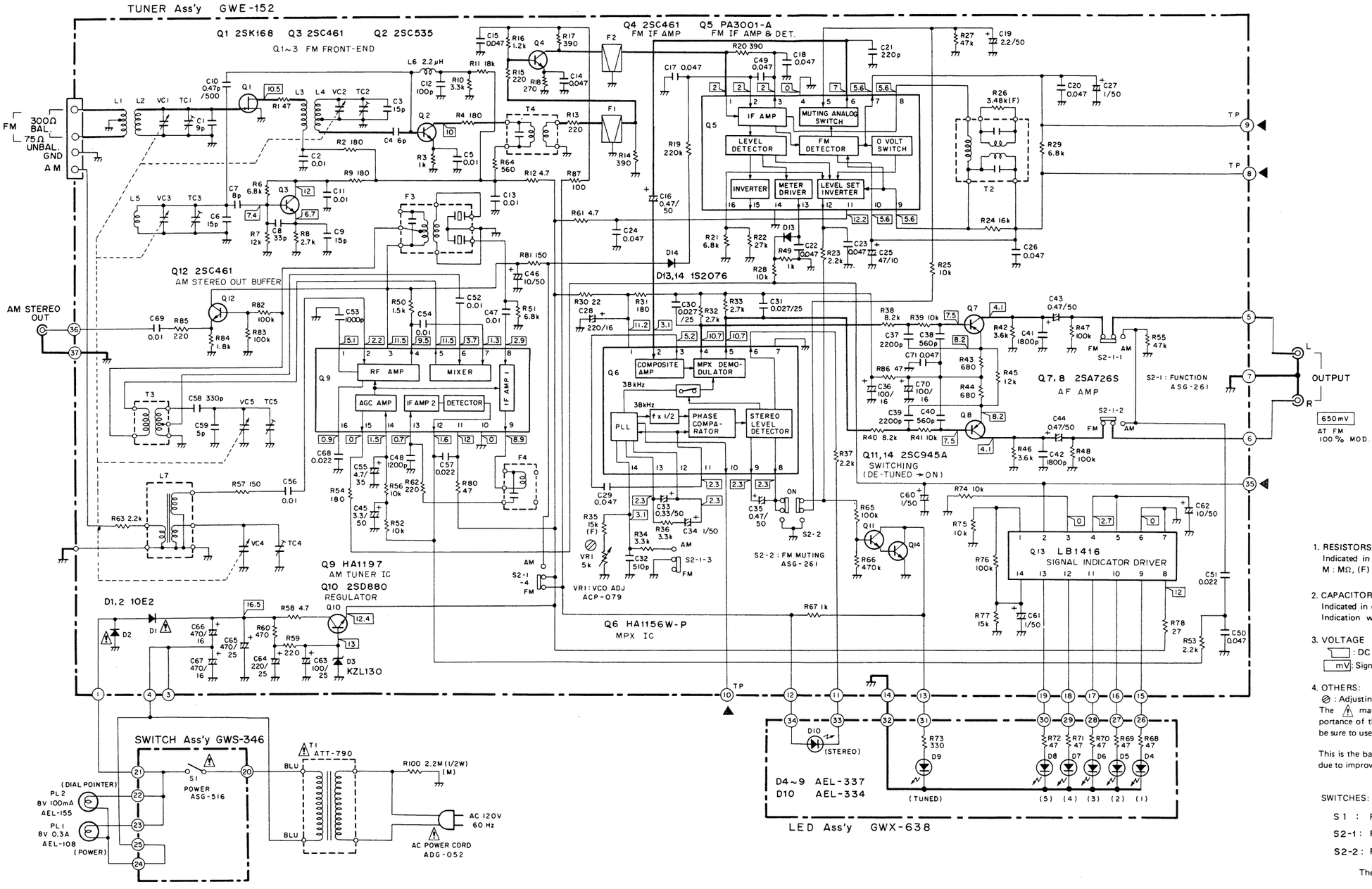


LB1416



8. SCHEMATIC DIAGRAM

NOTE:
The indicated semiconductors are representative ones only. Other alternative semiconductors may be used and are listed in the parts list.



1. RESISTORS:
Indicated in Ω, ¼W, ±5% tolerance unless otherwise noted k : kΩ, M : MΩ, (F) : ±1%, (G) : ±2%, (K) : ± 10%, (M) : -20% tolerance

2. CAPACITORS:
Indicated in capacity (μF)/voltage (V) unless otherwise noted p : pF
Indication without voltage is 50V except electrolytic capacitor.

3. VOLTAGE
: DC voltage (V) at no input signal
mV: Signal voltage at FM 400Hz 75kHz DEV.

4. OTHERS:
⊘ : Adjusting point.
The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

SWITCHES:

S1 : POWER ON — STAND-BY
S2-1 : FUNCTION FM — AM
S2-2 : FM MUTING ON — OFF

The underlined indicates the switch position.

9. ELECTRICAL PARTS LIST

NOTES:

- *When ordering resistors, first convert resistance values into code form as shown in the following examples.*
  Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J=5%, and K=10%).

560Ω	*56 × 10¹*	*561 ..... RD¼PS*	*5 6 1 J*
57kΩ	*47 × 10³*	*473 ..... RD¼PS*	*4 7 3 J*
0.5Ω	*0R5*	*..... RN2H*	*0 R 5 K*
1Ω	*010*	*..... RS1P*	*0 1 0 K*

  Ex. 2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62kΩ	*562 × 10¹*	*5621 .... RN¼SR*	*5 6 2 1 F*

- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★ .*
  ★★ GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

Miscellaneous Parts

Mark	Part No.	Symbol & Description	
⚠ ★	ATT-790	T1	Power transformer
★★	AEL-108	PL1	Lamp assembly
★★	AEL-155	PL2	Lamp with wires
⚠	ACN-029	R100	Carbon composition resistor (2.2M/½W)
⚠	ADG-052	AC power cord	
⚠	ADE-034	Output cords with phono plugs	
	GWE-152	Tuner assembly	
	GWS-346	Switch assembly	
	GWX-638	LED assembly	
	AKB-076	Terminal (AM STEREO OUT)	

Tuner Assembly (GWE-152)

CAPACITORS

Mark	Part No.	Symbol & Description	
	ACK-012	VC	Tuning capacitor
	ACM-006	TC3	Ceramic trimmer
	CCDUJ 090D 50	C1	
	CGB R47K 500	C10	
	CCDZM 050D 50	C59	
	CCDSL 060D 50	C4	
	CCDCH 080D 50	C7	
	CCDCH 150J 50	C9	
	CCDRH 150J 50	C6	
	CCDUJ 150J 50	C3	
	CCDCH 330J 50	C8	
	CCDSL 101J 50	C12	
	CCDSL 221J 50	C21	
	CKDYB 561K 50	C38,C40	
	CKDYB 102K 50	C53	
	CKDYB 122K 50	C48	
	CKDYB 182K 50	C41, C42	
	CKDYB 222K 50	C37, C39	
	CKDYX 273M 25	C30,C31	
	CKDYF 103Z 50	C2, C5, C11, C13, C47, C52, C54, C56,C69	
	CKDYF 473Z 50	C14, C15, C17, C18, C20, C22, C23, C26,C29,C49,C50,C71	
	CKDYX 473M 25	C24	
	CKDYF 223Z 50	C51,C57,C68	
	CQSA 331K 50	C58	
	CQSA 511J 50	C32	
	CEA R33M 50L	C33	
	CEA 010M 50L	C34	
	CEA R47M 50L	C16,C35,C43,C44	
	CEA 010M 50L	C27,C60,C61	
	CEA 2R2M 50L	C19	
	CEA 100M 50L	C46,C62	
	CEA 470M 10L	C25	
	CEA 4R7M 35L	C55	
	CEA 101M 25L	C63	
	CEA 221M 16L	C28	
	CEA 221M 25L	C64	
	CEA 471M 16L	C66,C67	
	CEA 471M 25L	C65	
	CEA 3R3M 50L	C45	
	CEA 101M 16L	C36,C70	

RESISTORS

NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description	
★	ACP-079	VR1	Semifixed (5k-B)
	RD¼PM □□□J	R1–R4, R6–R25, R27–R34, R36–R67, R74–R78, R80–R87	
	RN¼PQ □□□□F	R26,R35	

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	2SK168	Q1
★★	2SC535	Q2
★★	2SC461	Q3,Q4,Q12
★★	PA3001-A	Q5
★★	HA1156W-P	Q6
★★	2SA726S	Q7,Q8
★★	(2SA750)	
★★	HA1197	Q9
⚠ ★★	2SD880	Q10
⚠ ★★	(2SD313)	
★★	LB1416	Q13
★★	2SC945A	Q11,Q14
★★	(2SC2575)	
⚠ ★	10E2	D1,D2
⚠ ★	(SIB01-02)	
★	KZL130	D3
★	1S2076	D13,D14
★	(1S1555)	
★	(1S2473)	

COILS, FILTERS

Mark	Part No.	Symbol & Description	
	ATE-049	T2	FM det. transformer
	ATB-066	T3	AM osc. coil
	ATE-008	T4	FM IF transformer
	T24-028	L6	RF choke coil
	ATB-623	L7	Bar-antenna assembly
	ATF-053	F1,F2	FM ceramic filter
	ATF-121	F3	AM ceramic filter
	ATF-038	F4	AM IF filter

OTHERS

Mark	Part No.	Symbol & Description	
★★	ASG-261	S2	Push switch (FUNCTION,FM MUTING)
	AKA-014	Terminal 4-P (ANTENNA)	
	PMZ30P060FMC	Screw 3 × 6	
	VBZ30P100FZK	Screw 3 × 10	

Switch Assembly (GWS-346)

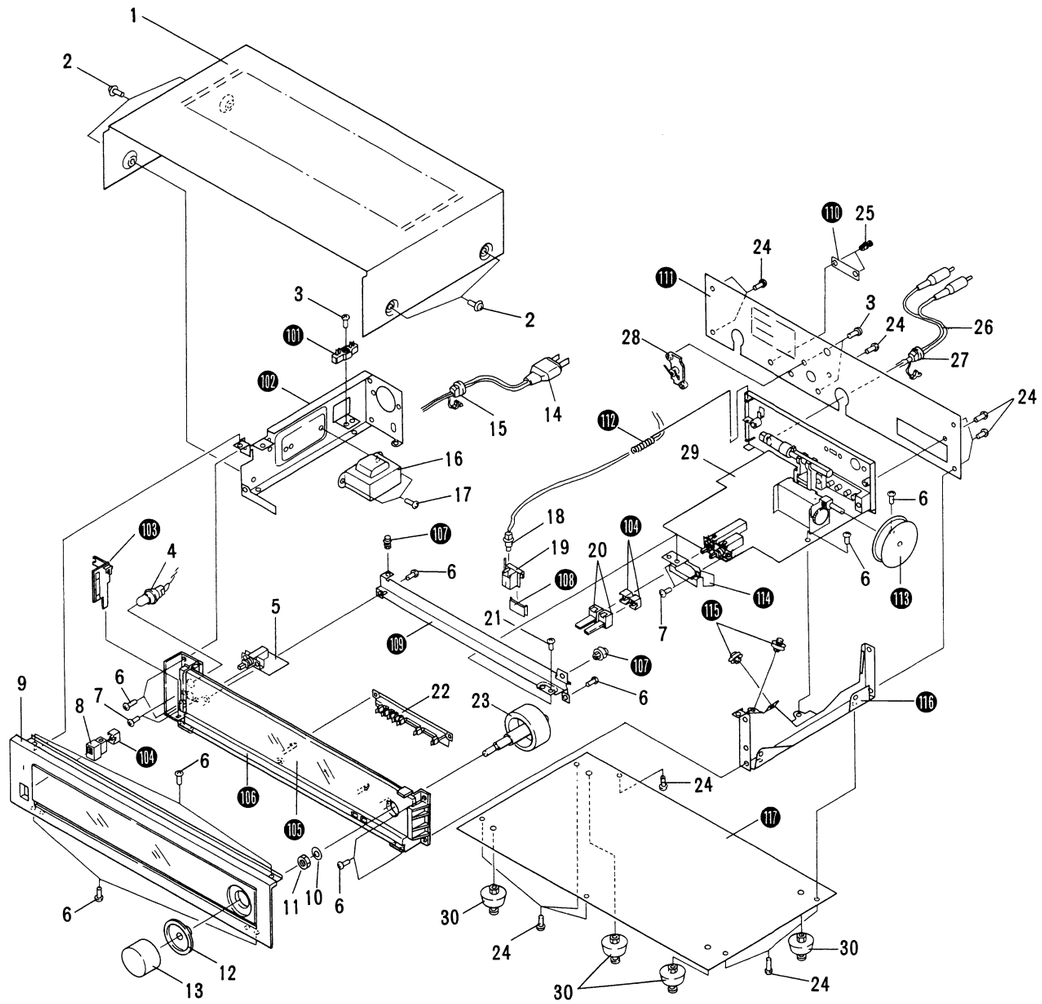
Mark	Part No.	Symbol & Description	
⚠ ★★	ASG-516	S1	Push switch (POWER)

LED Assembly (GWX-638)

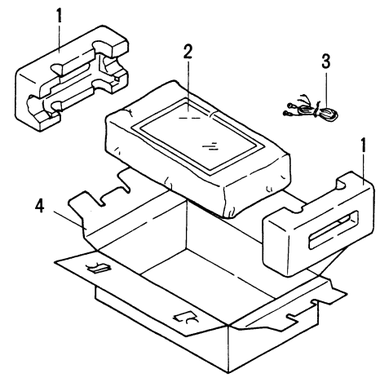
NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description	
	RD¼PM □□□J	R68–R73	
★	AEL-337	D4–D9	LED (Green)
★	AEL-334	D10	LED (Red)

10. EXPLODED VIEW



11. PACKING



Mark	No.	Part No.	Description
	1.	AHA-290	Side pad
	2.	ARB-403	Operating instructions
	3.	ADH-004	T-type FM antenna
	4.	AHD-899	Packing case

Parts List of Exploded View

NOTES:

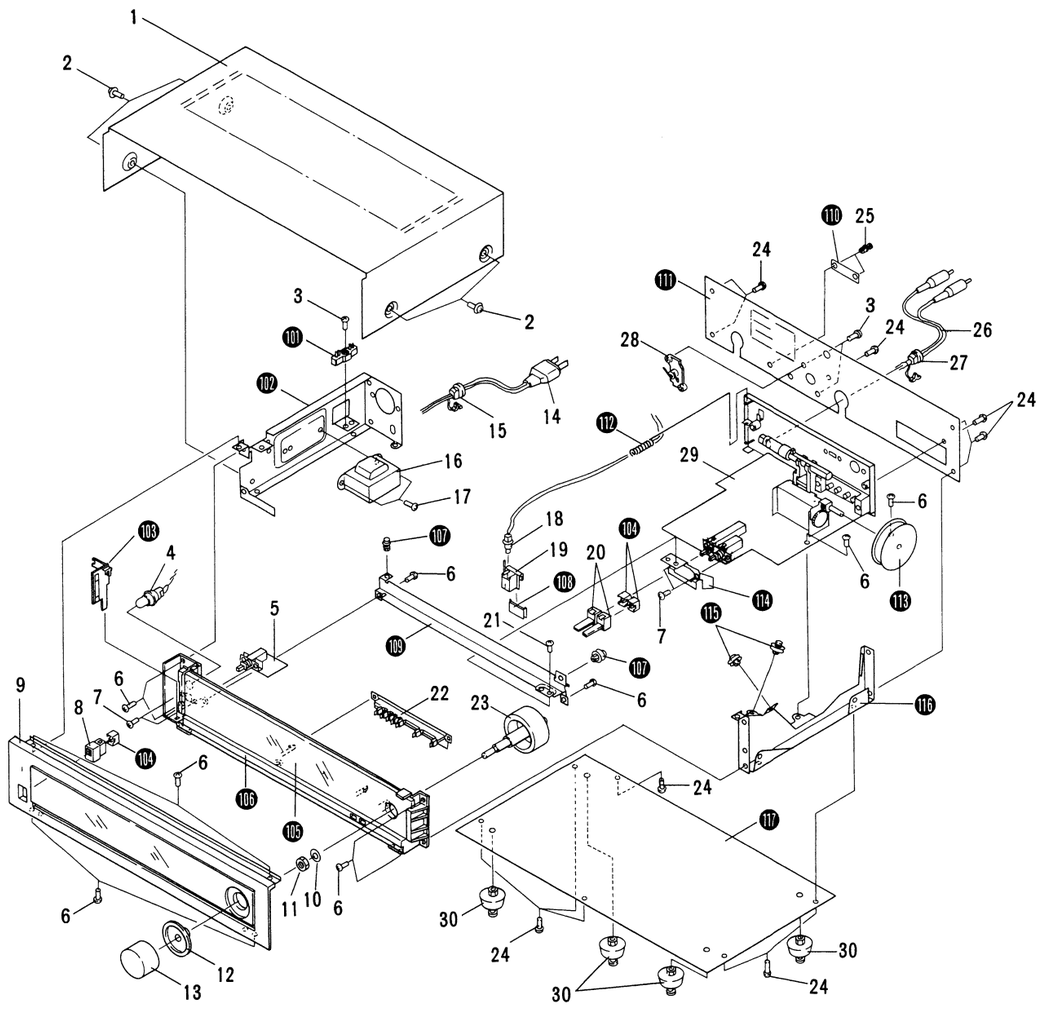
- *Parts without part number cannot be supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★ .*

★★ *GENERALLY MOVES FASTER THAN* ★

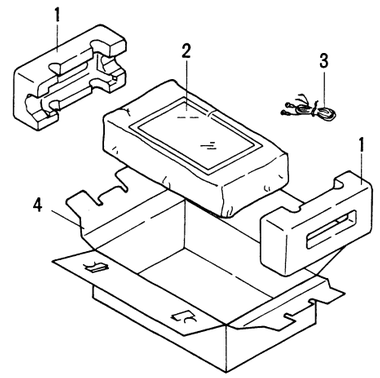
This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

Mark	No.	Part No.	Description
	1.	ANE-291	Top cover
	2.	FBT40P080FZK	Screw 4 X 8
	3.	VBZ30P100FZK	Screw 3 X 10
★★	4.	AEL-108	Lamp assembly
	5.	GWS-346	Switch assembly
	6.	VBZ30P080FMC	Screw 3 X 8
	7.	PMZ30P060FMC	Screw 3 X 6
	8.	AAD-264	Knob (POWER)
	9.	ANM-005	Front panel assembly
	10.	WA92F140U050	Flat washer
	11.	NK90FUC	Nut M9
	12.	AEC-741	Knob base
	13.	AAA-071	Knob (TUNING)
⚠	14.	ADG-052	AC power cord
	15.	AEC-327	Strain relief
⚠ ★	16.	ATT-790	Power transformer (120V)
	17.	ABA-252	Screw 3 X 8
★★	18.	AEL-155	Lamp with wires
	19.	AAF-111	Dial pointer assembly
	20.	AAD-268	Knob (FM MUTING, FUNCTION)
	21.	PMZ30P40FZB	Screw 3 X 4
	22.	GWX-638	LED assembly
	23.	AXA-292	Tuning shaft assembly
	24.	ABA-246	Screw 3 X 12
	25.	AEC-678	Nylon rivet
	26.	ADE-034	Output cords
	27.	AEC-760	Strain relief
	28.	AKB-076	Terminal (AM STEREO OUT)
	29.	GWE-152	Tuner assembly
	30.	AEC-609	Foot assembly
	31.		
	32.		
	101.		Terminal strip 2-P
	102.		Side frame L
	103.		Side cover
	104.		Flexible joint
	105.		Dial scale board
	106.		Sub-panel
	107.		Pulley assembly
	108.		Smoother
	109.		Plate
	110.		Serial number plate
	111.		Rear panel
	112.		Guide arm
	113.		Tuning drum
	114.		Holder
	115.		Pulley assembly
	116.		Side frame R
	117.		Bottom plate

10. EXPLODED VIEW



11. PACKING



Mark	No.	Part No.	Description
	1.	AHA-290	Side pad
	2.	ARB-403	Operating instructions
	3.	ADH-004	T-type FM antenna
	4.	AHD-899	Packing case

Parts List of Exploded View

NOTES:

- *Parts without part number cannot be supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★ .*

★★ *GENERALLY MOVES FASTER THAN* ★

This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

Mark	No.	Part No.	Description
	1.	ANE-291	Top cover
	2.	FBT40P080FZK	Screw 4 X 8
	3.	VBZ30P100FZK	Screw 3 X 10
★★	4.	AEL-108	Lamp assembly
	5.	GWS-346	Switch assembly
	6.	VBZ30P080FMC	Screw 3 X 8
	7.	PMZ30P060FMC	Screw 3 X 6
	8.	AAD-264	Knob (POWER)
	9.	ANM-005	Front panel assembly
	10.	WA92F140U050	Flat washer
	11.	NK90FUC	Nut M9
	12.	AEC-741	Knob base
	13.	AAA-071	Knob (TUNING)
⚠	14.	ADG-052	AC power cord
	15.	AEC-327	Strain relief
⚠ ★	16.	ATT-790	Power transformer (120V)
	17.	ABA-252	Screw 3 X 8
★★	18.	AEL-155	Lamp with wires
	19.	AAF-111	Dial pointer assembly
	20.	AAD-268	Knob (FM MUTING, FUNCTION)
	21.	PMZ30P40FZB	Screw 3 X 4
	22.	GWX-638	LED assembly
	23.	AXA-292	Tuning shaft assembly
	24.	ABA-246	Screw 3 X 12
	25.	AEC-678	Nylon rivet
	26.	ADE-034	Output cords
	27.	AEC-760	Strain relief
	28.	AKB-076	Terminal (AM STEREO OUT)
	29.	GWE-152	Tuner assembly
	30.	AEC-609	Foot assembly
	31.		
	32.		
	101.		Terminal strip 2-P
	102.		Side frame L
	103.		Side cover
	104.		Flexible joint
	105.		Dial scale board
	106.		Sub-panel
	107.		Pulley assembly
	108.		Smoother
	109.		Plate
	110.		Serial number plate
	111.		Rear panel
	112.		Guide arm
	113.		Tuning drum
	114.		Holder
	115.		Pulley assembly
	116.		Side frame R
	117.		Bottom plate

12. ADJUSTMENTS

12.1 FM TUNER SECTION

- Connect the FM signal generator (FM SG) to the FM antenna 300Ω terminal through a 300Ω dummy antenna.
- Set the FUNCTION switch to the FM position, the MUTING switch to the OFF position.
- The tuning coil in the FM front end dose not have an adjusting core.
  Consequently, tracking adjustments at 90MHz are performed by regulating the gap between rotor and stator of the tuning capacitors (VC1, VC2 and VC3).
  The expression "adjust VC (VC1, VC2 and VC3)" found in the text means that the two outer rotor blades of each of these tuning capacitors are be extended outwards with spatula (Part No. GGK-066) as shown in Fig. 12-1.

Step	FM SG (400Hz, ± 75kHz deviation)		Position of dial pointer	Adjustment point	Adjustment specification
	Frequency	Level			
1	Idle		106MHz	T2-N	0V DC between terminal no. 8 and no. 9.
2	106MHz	60 to 80dB	106MHz	TC3	Adjust until DC voltage between terminal no. 35 and ground is maximum, and 0V DC between terminal no. 8 and no. 9.
3	90MHz	60 to 80dB	90MHz	VC3	
4	Repeat steps 2 to 3 above.				
5	106MHz	20dB	106MHz	TC1,TC2	
6	90MHz	20dB	90MHz	VC1,VC2	
7	Repeat steps 5 to 6 until maximum sensitivity is attained.				
8	98MHz	66dB	98MHz	T4	Adjust until DC voltage between terminal no. 35 and ground is maximum.
9	Idle		98MHz	T2-N	0V DC between terminal no. 8 and no. 9.
10	98MHz	66dB	98MHz	T2-D	Adjust until distortion at OUTPUT terminal is minimum.
11	Repeat steps 9 to 10 until both specifications are correct.				
12	Set the MUTING switch to the ON position.				
13	98MHz	Variable	98MHz		Check that the muting circuit is not functioning at above 26dB. If not, remove R22.

Multiplex Decoder Section

- Connect the FM multiplex stereo signal generator (FM MPX SG) to the FM SG external modulation terminal.
- Set the output of the FM SG to 98MHz and level to 86dB (with modulation mode set to EXTERNAL) and tune the TX-520 unit to that frequency (98MHz).
- Set the MUTING switch to the ON position.

Step	FM MPX SG	Adjustment point	Adjustment specification
1	Idle (no modulation)	VR1	Adjust signal at terminal no. 10 to 19kHz (within ±100Hz).
2	Main (1kHz, L+R, ±67.5kHz deviation) Pilot (19kHz, 7.5kHz deviation)	T4 within ±90°	Adjust until distortion at OUTPUT terminal is minimum.

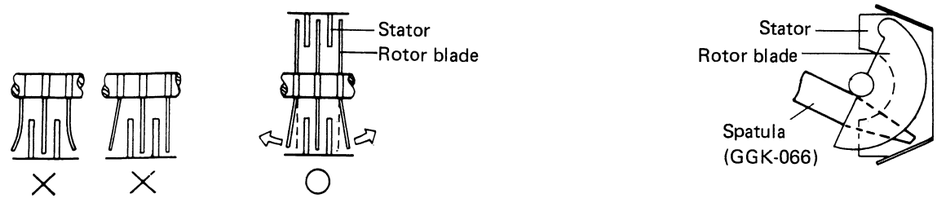


Fig. 12-1 Adjustment of tuning capacitor

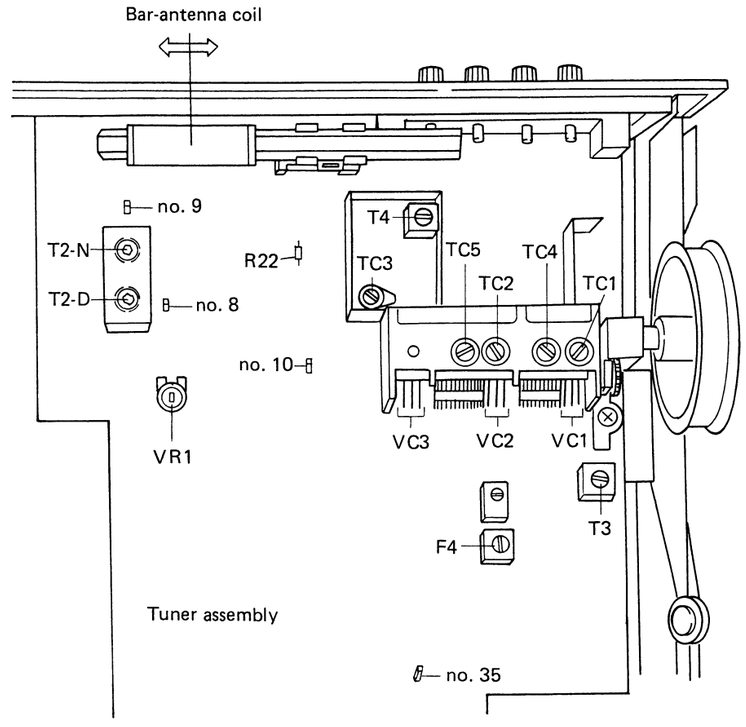


Fig. 12-2 Adjustment points and measuring points

12.2 AM TUNER SECTION

- Connect the AM signal generator (AM SG) to the AM ANTENNA terminal through a 10kΩ resistor.
- Set the FUNCTION switch to the AM position.

Step	AM SG (400Hz, 30% modulation)		Position of dial pointer	Adjustment point	Adjustment specification
	Frequency	Level			
1	1400kHz	100dB	1400kHz	TC5	Adjust until demodulated signal at OUTPUT terminal is maximum.
2	600kHz	100dB	600kHz	T3	
3	Set the AM SG to 30dB output level, repeat steps 1 to 2 above.				
4	1400kHz	50dB	1400kHz	TC4	Adjust until demodulated signal at OUTPUT terminal is maximum.
5	600kHz	50dB	600kHz	Bar-antenna*	
6	Repeat steps 4 to 5 until maximum sensitivity is attained.				
7	1000kHz	50dB	1000kHz	F4	Adjust until maximum sensitivity is attained.

*Slide the bar-antenna coil along the core.

12. RÉGLAGE

12.1 SECTION TUNER FM

- Raccorder le générateur de signaux FM (FM SG) à la borne de l'antenne FM 300 Ω au moyen d'une antenne fictive de 300 Ω.
- Amener l'interrupteur FUNCTION en position FM et l'interrupteur MUTING en position OFF.
- La bobine d'accord à l'entrée FM n'est pas pourvue de bobine de réglage. Par conséquent, les alignements à 90 MHz sont exécutés an réglant l'espace entre le rotor et le stator des condensateurs d'accord (VC1, VC2 et VC3). L'expression "Régler VC (VC1, VC2 et VC3)" dans le texte signifie que les deux palettes du rotor exterieur de chacun de ces deux condensateurs d'accord doivent être tournées vers l'extérieur au moyen d'une spatule (pièce nº GGK-066), comme indiqué sur la figure 12-1.

Pas	FM SG (400 Hz, ± 75 kHz dérive)		Position de l'indicateur	Point de réglage	Spécification de réglage
	Fréquence	Niveau			
1	Déwatté		106 MHz	T2-N	0V CC entre la borne nº 8 et nº 9.
2	106 MHz	60 à 80 dB	106 MHz	TC3	Régler jusqu'à ce que le voltage CC entre la borne nº 35 et la mise à terre est au maximum et 0V CC entre la borne nº 8 et nº 9.
3	90 MHz	60 à 80 dB	90 MHz	VC3	
4	Répéter le pas 2 et 3				
5	106 MHz	20 dB	106 MHz	TC1, TC2	
6	90 MHz	20 dB	90 MHz	VC1, VC2	
7	Répéter les pas 5 et 6 jusqu'à ce que la sensibilité maximum est atteinte.				
8	98 MHz	66 dB	98 MHz	T4	Régler jusqu'à ce que le voltage CC entre la borne nº 35 et la mise à terre est au maximum.
9	Déwatté		98 MHz	T2-N	0V CC entre la borne nº 8 et nº 9.
10	98 MHz	66 dB	98 MHz	T2-D	Régler jusqu'à ce que la distortion à la borne OUTPUT est minimum.
11	Répéter les pas 9 et 10 jusqu'à l'obtention des valeurs correctes.				
12	Amener l'interrupteur MUTING en position ON.				
13	98 MHz	Variable	98 MHz	Contrôler si le circuit de silencieux fonctionne au dessus de 26 dB. Si cela n'est pas le cas, enlever R22.	

Section décodeur multiplex

- Raccorder le générateur de signaux stéréo multiplex FM à la borne de modulation externe FM SG.
- Régler la valeur de sortie du FM SG à 98 MHz, le nivau à 86 dB (la commande de modulation étant sur EXTERNAL) et le TX-520 à la même fréquence (98 MHz).
- Amener l'interrupteur MUTING en position ON.

Pas	FM MPX SG	Point de réglage	Spécification de réglage
1	Déwatté (pas de modulation)	VR1	Régler le signal à la borne nº 10 à 19 kHz (entre ± 100 Hz)
2	Principal (1 kHz, L+R, ± 67,5 kHz déviation) Pilote (19 kHz, ±7,5 kHz déviation)	T4 entre ± 90°	Régler jusqu'à ce que la distortion à la borne OUTPUT est minimum.

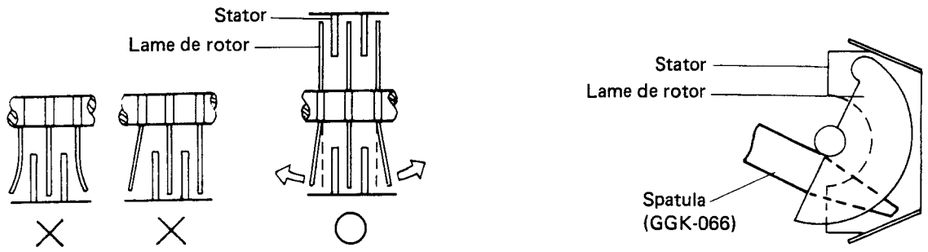
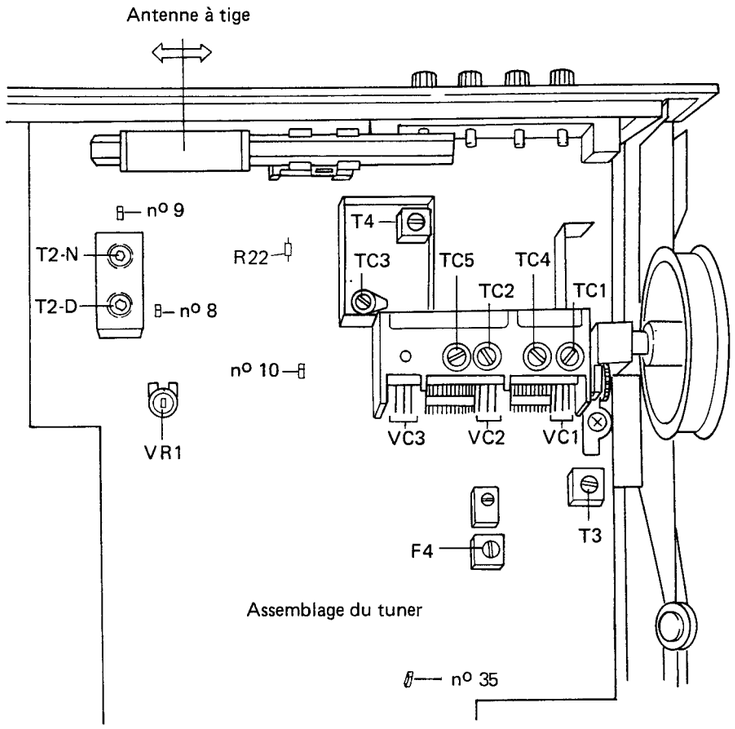


Fig. 12-1 Réglage du condensateur d'accord



Assemblage du tuner

Fig. 12-2 Points de réglage et de mesure

12.2 SECTION TUNER AM

- Raccorder le générateur de signaux AM (AM SG) à la borne AM ANTENNA au moyen d'une résistance de 10 kΩ.
- Amener l'interrupteur FUNCTION en position AM.

Pas	AM SG (400 Hz, 30% modulation)		Position de l'indicateur	Point de réglage	Spécification de réglage
	Fréquence	Niveau			
1	1400 kHz	100 dB	1400 kHz	TC5	Régler jusqu'à ce que le signal démodulé à la borne OUTPUT est maximum.
2	600kHz	100dB	600 kHz	T3	
3	Régler le AM SG sur 30 dB de niveau de sortie; répéter les pas 1 et 2.				
4	1400 kHz	50 dB	1400 kHz	TC4	Régler jusqu'à ce que le signal démodulé à la borne OUTPUT est maximum.
5	600 kHz	50 dB	600 kHz	Antenne-tige*	
6	Répéter les pas 4 et 5 jusqu'à l'obtention de la sensibilité maximum.				
7	1000 kHz	50 dB	1000 kHz	F4	Régler jusqu'à obtention de la sensibilité maximum.

* Faire glisser la bobine de l'antenne à tige le long de l'âme.

12. AJUSTE

12.1 SECCIÓN DEL SINTONIZADOR DE FM

- Conectar el generador de señales de FM (FM SG) al terminal de 300 ohmios de la antena de FM a través de una antena ficticia de 300 ohmios.
- Poner el selector de función (FUNCTION) en la posición FM y el interruptor de silenciamiento (MUTING) en la posición OFF.
- La bobina de sintonización de la sección de entrada de FM no está provista de núcleo de ajuste. Consecuentemente, los ajustes de seguimiento a 90 MHz se llevan a cabo regulando el entrehierros entre el rotor y el estator de los capacitores de sintonización (VC1, VC2 y VC3). La expresión "ajustar los VC (VC1, VC2 y VC3)" que se encuentra en el texto significa que las dos paletas del rotor exterior de cada uno de estos capacitores tienen que extenderse hacia afuera con la espátula (parte no. GGK-066) como se muestra en la figura 12-1.

Paso	FM SG (400 Hz, desviación de ± 75 kHz)		Posición del indicador del cuadrante	Punto de ajuste	Especificación del ajuste
	Frecuencia	Nivel			
1	Libre		106 MHz	T2-N	0V CC entre el terminal no. 8 y el no. 9.
2	106 MHz	60 a 80 dB	106 MHz	TC3	Ajustar hasta que la tensión de CC entre el terminal no. 35 y masa sea el máximo, y 0V CC entre el terminal no. 8 y el no. 9.
3	90 MHz	60 a 80 dB	90 MHz	VC3	
4	Repetir los pasos 2 y 3 de arriba.				
5	106 MHz	20 dB	106 MHz	TC1, TC2	
6	90 MHz	20 dB	90 MHz	VC1, VC2	
7	Repetir los pasos 5 y 6 hasta que se consiga la máxima sensibilidad.				
8	98 MHz	66 dB	98 MHz	T4	Ajustar hasta que la tensión de CC entre el terminal no. 35 y masa sea el máximo.
9	Libre		98 MHz	T2-N	0V CC entre el terminal no. 8 y el no. 9.
10	98 MHz	66 dB	98 MHz	T2-D	Ajustar hasta que la distorsión en el terminal de salida (OUTPUT) sea la mínima.
11	Repetir los pasos 9 y 10 hasta que ambas especificaciones sean correctas.				
12	Poner el interruptor de silenciamiento (MUTING) en la posición ON.				
13	98 MHz	Variable	98 MHz		Comprobar que el circuito de silenciamiento no esté funcionando por encima de 26 dB. Si no es así, extraer R22.

Sección del decodificador de multiplex

- Conectar el generador de señales estereofónicas de multiplex de FM (FM MPX SG) al terminal de modulación exterior del FM SG.
- Ajustar la salida del FM SG a 98 MHz y el nivel a 86 dB (con el modo de modulación ajustado a EXTERNAL) y sintonizar el TX-520 a esta frecuencia (98 MHz).
- Poner el interruptor de silenciamiento (MUTING) en la posición ON.

Paso	FM MPX SG	Punto de ajuste	Especificación del ajuste
1	Libre (sin modulación)	VR1	Ajustar la señal en el terminal no. 10 a 19 kHz (dentro de ± 100 Hz).
2	Principal (1 kHz, Izq. + Der., ± 67,5 kHz de desviación) Piloto (19 kHz, ± 7,5 kHz de desviación)	T4 dentro de ± 90°	Ajustar hasta que la distorsión en el terminal de salida (OUTPUT) sea la mínima.

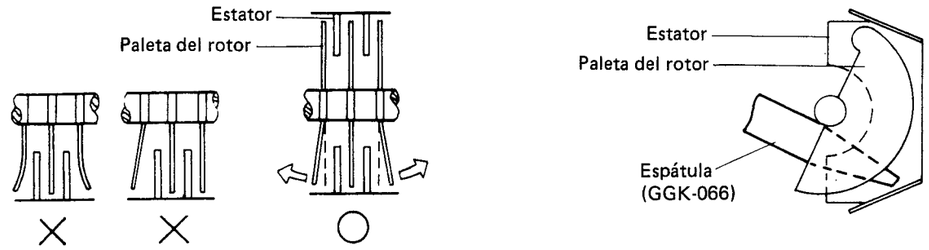


Fig. 12-1 Ajuste capacidad de sintonización

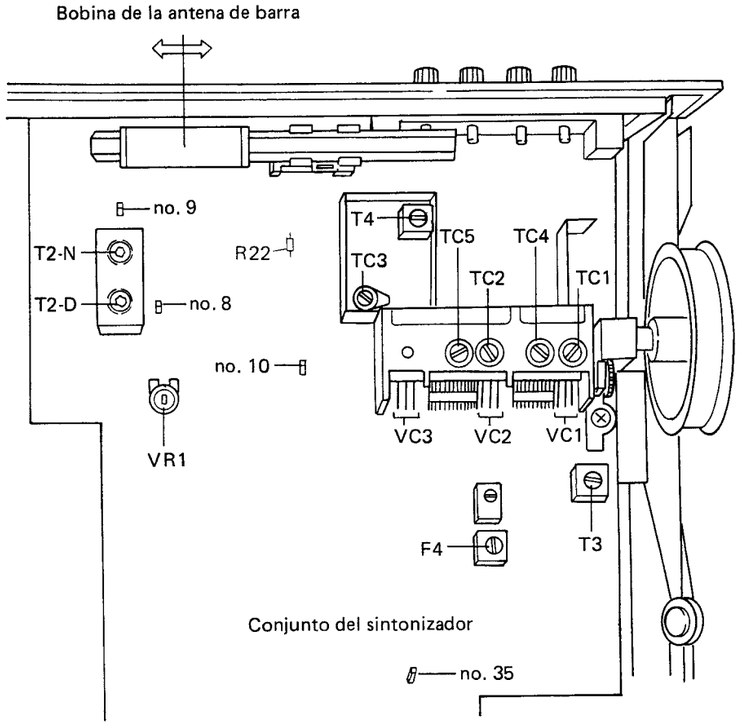


Fig. 12-2 Puntos de ajuste y de medición

12.2 SECCIÓN DEL SINTONIZADOR DE AM

- Conectar el generador de señales de AM (AM SG) al terminal para antena de AM (AM ANTENNA) a través de un resistor de 10 K ohmios.
- Poner el selector de función (FUNCTION) a la posición de AM.

Paso	AM SG (400 Hz, modulación al 30%)		Posición del indicador del cuadrante	Punto de ajuste	Especificación del ajuste
	Frecuencia	Nivel			
1	1400 kHz	100 dB	1400 kHz	TC5	Ajustar hasta que la señal demodulada en el terminal de salida (OUTPUT) sea la máxima.
2	600 kHz	100 dB	600 kHz	T3	
3	Ajustar el AM SG a 30 dB de nivel de salida, repetir los pasos 1 y 2 de arriba.				
4	1400 kHz	50 dB	1400 kHz	TC4	Ajustar hasta que la señal demodulada en el terminal de salida (OUTPUT) sea la máxima.
5	600 kHz	50 dB	600 kHz	Antena de barra*	
6	Repetir los pasos 4 y 5 hasta que se consiga la máxima sensibilidad.				
7	1000 kHz	50 dB	1000 kHz	F4	Ajustar hasta lograrse la máxima sensibilidad.

* Deslizar la bobina de la antena de barra por el núcleo.

ADDITIONAL

Service Manual

PIONEER

STEREO TUNER

TX-520 YP,S,S/G

This additional service manual is applicable to the YP type (Australia model), S type (General export model) and S/G type (U.S. Military model). The basic performance of the YP, S and S/G types is the same as the KU type (U.S.A. model), please refer to the KU type service manual (pp. 1–23) with the exception of this informations.

SPECIFICATIONS

The specifications for YP,S and S/G types are the same as the KU type except for following sections:

Miscellaneous

Power Requirements
YP type a.c.240V, 50/60Hz
S and S/G type ..... AC110/120/220/240V (Switchable), 50/60Hz
Power Consumption 13W

MISCELLANEOUS PARTS

NOTES:
- *Parts without part number cannot be supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★ .*
  ★★ GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

The parts for YP, S and S/G types are the same as the KU type except for following sections:

Mark	Symbol & Description		Part No.				Remarks
			KU type	YP type	S type	S/G type	
⚠ ★	T1	Power transformer (120V)	ATT-790	....	....	....	
		(240V)	....	ATT-699	....	....	
		(110V/120V/220V/240V)	....	....	ATT-700	ATT-700	
⚠	R100	Carbon composition resistor (2.2M/½W)	ACN-029	....	....	....	

Mark	Symbol & Description	Part No. KU type	YP type	S type	S/G type	Remarks
	Tuner assembly	GWE-152	GWE-156	GWE-153	GWE-154	
	LED assembly	GWX-638	GWX-644	GWX-639	GWX-640	
	Switch assembly	GWS-346	GWS-340	GWS-334	GWS-335	
⚠	AC power cord	ADG-052	ADG-043	ADG-046	ADG-046	
	Output cords with phonoplugs	ADE-034	ADE-033	ADE-033	ADE-033	
⚠ ★★	Line voltage selector	. . . .	. . . .	AKX-063	AKX-063	
	Terminal (AM STEREO OUT)	AKB-076	. . . .	. . . .	. . . .	
	Operating instructions	ARB-403	ARB-404	ARB-404	ARB-404	
	Packing case	AHD-899	AHD-900	AHD-900	AHD-900	

P.C.BOARD ASSEMBLIES

Tuner Assembly (GWE-156)

CAPACITORS

Mark	Part No.	Symbol & Description
	ACK-012	VC Tuning capacitor
	ACM-006	TC3 Ceramic trimmer
	CCDUJ 090D 50	C1
	CGB R47K 500	C10
	CCDZM 050D 50	C59
	CCDSL 060D 50	C4
	CCDCH 080D 50	C7
	CCDCH 150J 50	C9
	CCDRH 150J 50	C6
	CCDUJ 150J 50	C3
	CCDCH 330J 50	C8
	CCDSL 101J 50	C12
	CCDSL 221J 50	C21
	CKDYB 561K 50	C38, C40
	CKDYB 102K 50	C53
	CKDYB 122K 50	C48
	CKDYB 182K 50	C41, C42
	CKDYB 222K 50	C37, C39
	CKDYX 273M 25	C30, C31
	CKDYF 103Z 50	C2, C5, C11, C13, C47, C52, C54, C56
	CKDYF 473Z 50	C14, C15, C17, C18, C20, C22, C23, C26,C29,C49,C50,C71
	CKDYX 473M 25	C24
	CKDYF 223Z 50	C51,C57,C68
	CQSA 331K 50	C58
	CQSA 511J 50	C32
	CEANL R33M 50	C33
	CEANL 010M 50	C34
	CEA R47M 50L	C16,C35,C43,C44
	CEA 010M 50L	C27,C60,C61
	CEA 2R2M 50L	C19
	CEA 100M 50L	C46, C62
	CEA 470M 10L	C25
	CEA 4R7M 35L	C55
	CEA 101M 25L	C63
	CEA 221M 16L	C28
	CEA 221M 25L	C64
	CEA 471M 16L	C66,C67
	CEA 471M 25L	C65
	CEA 3R3M 50L	C45
	CEA 101M 16L	C36,C70

RESISTORS

NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
★	ACP-079	VR1 Semifixed (5k-B)
	RD¼PM □□□J	R1–R4, R6–R25, R27–R34, R86, R36–R67,R74–R78,R80,R81,R87
	RN¼PQ □□□□F	R26,R35

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	2SK168	Q1
★★	2SC535	Q2
★★	2SC461	Q3,Q4
★★	PA3001-A	Q5
★★	HA1156W-P	Q6
★★	2SA726S	Q7,Q8
★★	(2SA750)	
★★	HA1197	Q9
⚠ ★★	2SD880	Q10
⚠ ★★	(2SD313)	
★★	LB1416	Q13
★★	2SC945A	Q11,Q14
★★	(2SC2575)	
⚠ ★	10E2	D1,D2
⚠ ★	(SIB01–02)	
★	KZL130	D3
★	1S2076	D13,D14
★	(1S1555)	
★	(1S2473)	

COILS, FILTERS

Mark	Part No.	Symbol & Description	
	ATE-049	T2	FM det. transformer
	ATB-066	T3	AM osc. coil
	ATE-008	T4	FM IF transformer
	T24-028	L6	RF choke coil
	ATB-623	L7	Bar-antenna assembly
	ATF-053	F1,F2	FM ceramic filter
	ATF-108	F3	AM ceramic filter
	ATF-038	F4	AM IF filter

OTHERS

Mark	Part No.	Symbol & Description	
★★	ASG-261	S2	Push switch (FUNCTION,FM MUTING)
	AKA-016		Terminal 4-P (ANTENNA)
	PMZ30P060FMC		Screw 3 X 6
	VBZ30P100FZK		Screw 3 X 10

Tuner Assembly (GWE-153, GWE-154)

The component parts of GWE-153 and GWE-154 are the same as the GWE-156 with the exception of following sections:

Symbol No.	Part No. (GWE-156)	Part No. (GWE-153, 154)
C30, C31	CKDYX 183M 25	CKDYX 273M 25
F3	ATF-108	ATF-121

Description	Part No. (GWE-154, 156)	Part No. (GWE-153)
Terminal (ANTENNA)	AKA-016	AKA-014

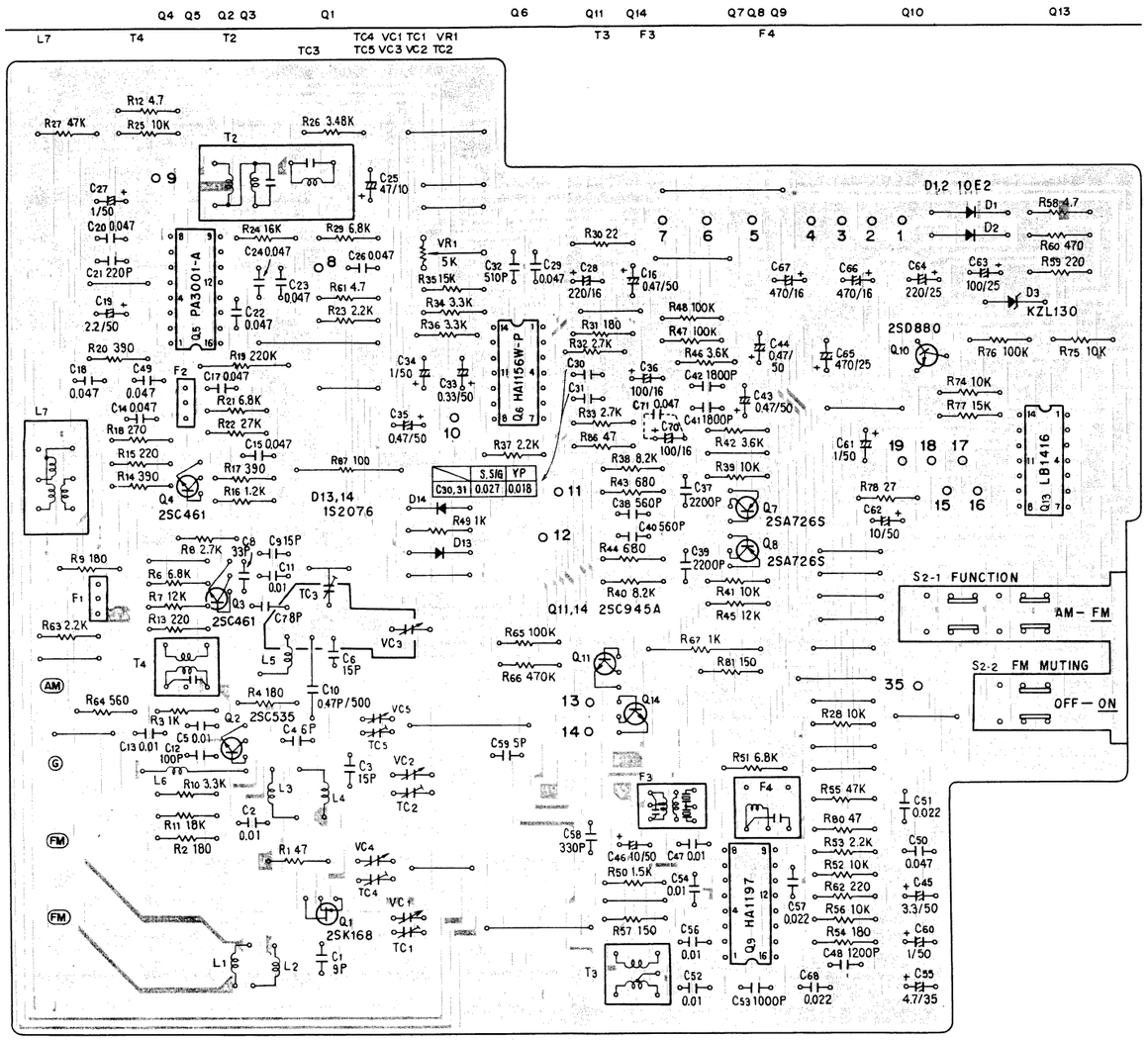
LED Assembly (GWX-639, GWX-640, GWX-644)

These assemblies are the same as the GWX-638 (for KU type).

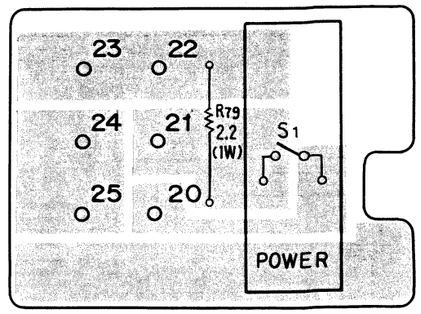
Switch Assembly (GWS-334, GWS-335, GWS-340)

Mark	Part No.	Symbol & Description	
⚠ ★★	ASG-516	S1	Push switch (POWER)
⚠	RN1P 2R2K	R79	

Tuner Assembly (GWE-153, GWE-154, GWE-156)

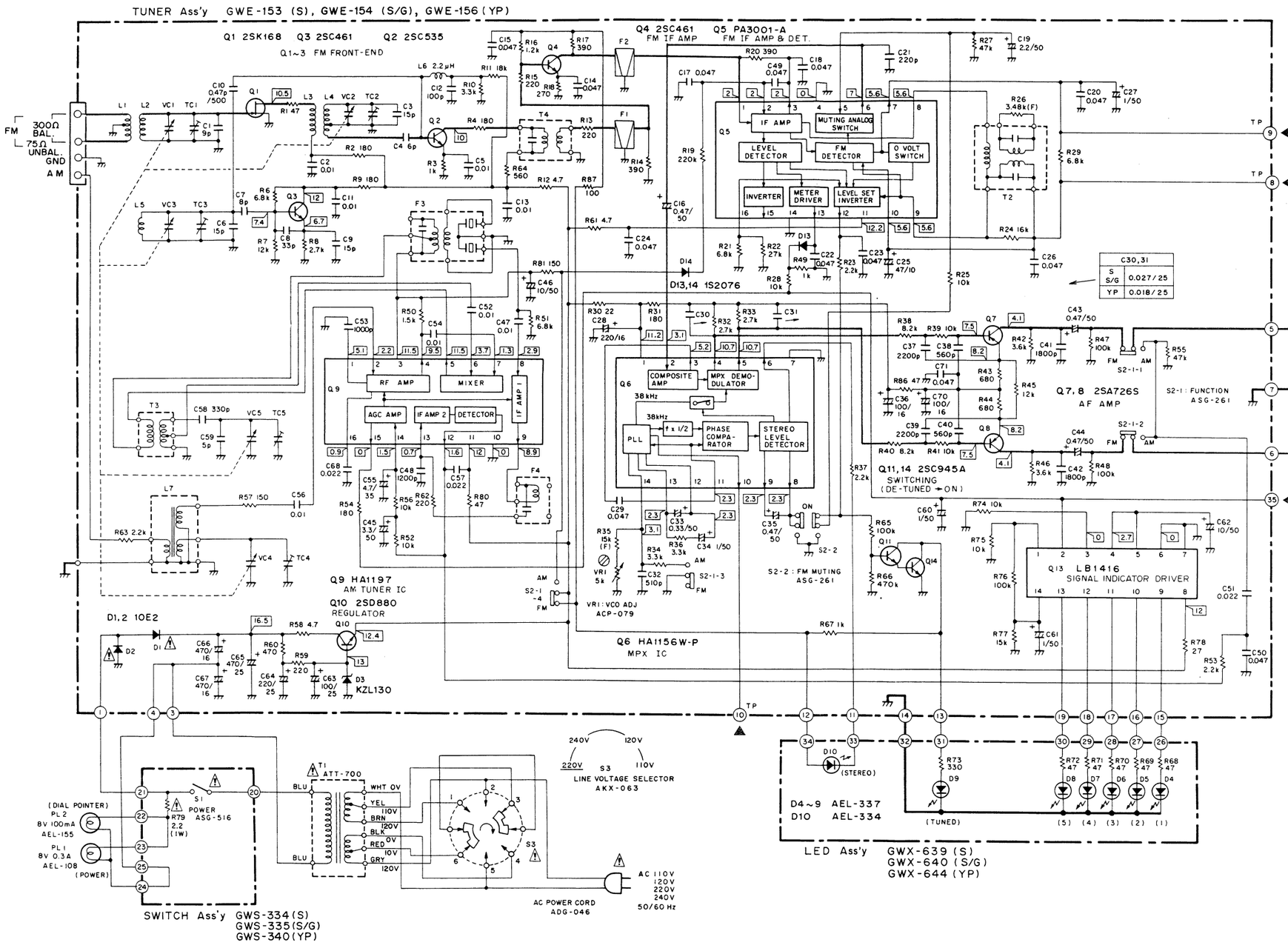


Switch Assembly (GWS-340, GWS-334, GWS-335)



SCHEMATIC DIAGRAM FOR YP,S AND S/G TYPES

NOTE:
The indicated semiconductors are representative ones only. Other alternative semiconductors may be used and are listed in the parts list.



1. RESISTORS:
   Indicated in Ω, ¼W, ±5% tolerance unless otherwise noted k : kΩ, M : MΩ, (F) : ±1%, (G) : ±2%, (K) : ±10%, (M) : ±20% tolerance

2. CAPACITORS:
   Indicated in capacity (μF)/voltage (V) unless otherwise noted p : pF
   Indication without voltage is 50V except electrolytic capacitor.

3. VOLTAGE
   : DC voltage (V) at no input signal
   mV: Signal voltage at FM 400Hz 75kHz DEV.

4. OTHERS:
   ⊘ : Adjusting point.
   The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

   This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

SWITCHES:

S1 : POWER ON – STAND-BY
S2-1: FUNCTION FM – AM
S2-2: FM MUTING ON – OFF
S3 : LINE VOLTAGE SELECTOR
110V – 120V – 220V – 240V

The underlined indicates the switch position.